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EXAMINER

KRONENTHAL, CRAIG W

ART UNIT PAPER NUMBER

2623

DATE MAILED: 01/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/010,026	PELLEY ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Craig W Kronenthal	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-3,7-9,16-19,24,25,32-62 and 64-66 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,16-19,32-62 and 64-66 is/are rejected.
- 7) ☒ Claim(s) 4-15,20-31,39,40,63 and 64 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/6/01</u> . | 6) <input type="checkbox"/> Other: ____  |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to because there is no drawing labeled Figure 1. Based on the specification the unlabeled drawing should be labeled Figure 1. As the drawings were submitted, the lowest numbered figure is Figure 2. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Information Disclosure Statement***

2. Applicants are respectfully requested to provide a copy of European Patent Office Search Report (Issued on October 11, 2004) associated with the IDS filed on December 3, 2004.

***Claim Objections***

3. Claims 4, 12, 20, 28, 32, 39, 41, 44, 46, 54, 56, and 58 are objected to because of the following informalities:

- In line 1 of claims 4, 12, 20, 28, 32, 39, 41, 44, 46, 54, 56, and 58 "material" should be corrected to "an information signal representing material".

Appropriate correction is required.

4. Claims 16, 45, and 63-66 are objected to because of the following informalities:

- In line 1 of claims 16, 45, and 63-66 "a computer program product" should be corrected to "A computer program product embodied in a computer readable medium".

Appropriate correction is required.

5. Claim 7 is objected to because of the following informalities:

- In claim 7, line 1 it is believed that "according to claim 4" should read "according to claim 5".

Appropriate correction is required.

6. Claims 8 and 9 are objected to because of the following informalities:

- In claim 8, line 1 “according to claim 4” should read “according to claim 5”. Claim 9 is objected to because it is dependent on claim 8.

Appropriate correction is required.

7. Claim 11 is objected to because of the following informalities:

- In claim 11, line 2 “UMID” must not be abbreviated. Replace “UMID” with “Unique Material Identifier (UMID)”.

Appropriate correction is required.

8. Claim 12 is objected to because of the following informalities:

- In claim 12, line 4 “PRSS” must not be abbreviated. Replace “PRSS” with “Pseudo Random Symbol Sequence (PRSS)”.

Appropriate correction is required.

9. Claim 24 is objected to because of the following informalities:

- Claim 24 is dependent on claim 20, but refers to “the offset”. There is no prior mention of any “offset” in claim 20. It is believed that this claim was intended to be dependent on claim 21, where there is prior mention of an “offset”.

Appropriate correction is required.

10. Claim 25 is objected to because of the following informalities:

- Claim 25 reads "according to claim 25". A claim cannot be dependent on itself.

It is believed the claim should be written "according to claim 24".

Appropriate correction is required.

11. Claims 39, 40, and 64 are objected to because of the following informalities:

- In claim 39 (page 30, line 15) "with a respective" should be changed to "with respective". Claims 40 and 64 are objected to because they are dependent on claim 30.

Appropriate correction is required.

### ***Specification***

12. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

***Claim Rejections - 35 USC § 102***

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

14. Claims 1-3 and 16-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Cox et al. (PN 5,930,369). (hereinafter Cox)

Regarding Claim 1: Cox discloses a method of embedding data in an information signal representing material, the method comprising:

- Combining the information signal with a function of the data and a scaling factor (col. 9 lines 60-61), the data being recoverable from the combination by a decoding process (col. 9 lines 56-59); wherein the information signal, prior to forming the combination, is subject to the decoding process as trial (col. 10 lines 32-36). The information signal (X) is combined with watermark data (W) and scaler (alpha) according to equation 1. The watermark data (W\*) can be recovered by a decoding process. The trial decode is performed on document (D) which contains information signal (X) to compute a distorted document (D\*) which contains a distorted information signal (X\*).
- The scaling factor is generated as a function of the trial decoding process (col. 10 lines 36-37). The scaling factor (alpha) is determined based on the distorted information signal (X\*) resulting from the trial decode.

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Regarding Claims 16 and 17: The analogous arguments made regarding claim 1 are applicable to claims 16 and 17.

Regarding Claim 2: Cox discloses a method according to claim 1, wherein the step of combining involves modulating a pseudo random symbol sequence with the said data (col. 7 lines 1-4) and the trial decoding comprises the step of correlating a pseudo random symbol sequence with the said representation of the material (col. 10 lines 32-36), and the scaling factor is generated in dependence on the result of the correlation (col. 10 lines 36-37). Cox discloses the watermark data being randomly generated, which indicates that the watermark data was modulated with a sequence comparable to a pseudo random symbol sequence. The trial decoding correlates a random watermark (W) contained in the information signal (X) with the distorted information signal ( $X^*$ ) representing a material. The scaling factor is determined to be proportionally dependent on the result of this correlation which is given in the absolute value of the difference between the a distorted information signal ( $X^*$ ) and original information signal (X) (col. 10 line 37).

Regarding Claim 18: The analogous arguments made regarding claim 2 are applicable to claim 18.

Regarding Claim 3: Cox discloses a method of embedding data in an information signal representing material comprising the steps of:



- Combining, as a trial, a representation of the material with a function of the data and a trial scaling factor (col. 9 lines 47-50). The representation of the material (X) is combined with the data (W) and a trial scaling factor (alpha) in block 42 of Figure 3a.
- Performing, as a trial, a predetermined process on the combined material and data (col. 10 lines 32-36). The combined material and data (X') is inserted into document (D) resulting in the watermarked document (D') by the block 44 of Figure 3a (col. 9 lines 49-51). The watermarked document (D') is then processed by a chosen attack to produce the distorted watermarked document (D\*) (col. 9 lines 52-53). This predetermined process or attack is not shown in Figure 3a or 3b but is understood to occur between the D' at the bottom of Figure 3a and the D (which should be a D\*) at the top of Figure 3b.
- Performing a trial decoding of the processed combined material and data (col. 9 lines 53-59). The trial decoding is shown in Figure 3b by the extraction block (46), differencing block (48), and postprocessing block (50). The trial decoding acts on the combined material and data (Fig. 3b, D) (which should be D\*) to extract the corrupted data (W\*) thereby separating/decoding the material and data.
- Adjusting the scaling factor as a function of the trial decoding of the processed combined material and data (col. 10 lines 34-37). The scaling factor (alpha) is adjusted to (alpha i) as a result of the extracted corrupted material (X\*) computed in the trial decoding.

Regarding Claim 19: The analogous arguments made regarding claim 3 are applicable to claim 19.

15. Claims 32-39, 45-54, 59-62, and 64 are rejected under 35 U.S.C. 102(b) as being anticipated by Donescu et al. (PN 6,674,873). (hereinafter Donescu)

Regarding Claims 32, 45, and 46: Donescu discloses a method of embedding data in material, comprising the steps of:

- Producing transform coefficients  $C_i$  of the material (col. 8 line 64 – col. 9 line 4).  
The image  $I$  is transformed in step E1 into a spectral and statistical representation, which include transform coefficients. Step 1 may include DCT transformation or wavelet transformation.
- Comparing the magnitudes of the coefficients with a threshold value  $T$  (col. 9 lines 7-12). It is inherent in step E2 that the magnitudes of the transform coefficients are compared to a threshold value in order to extract the low frequency coefficients.
- Producing from the coefficients  $C_i$  and the said data, modified coefficient values  $C_i'$  which are modified by respective information symbols of a pseudo random symbol sequence modulated by the said data to be embedded (col. 10 lines 26-32). The coefficients  $dc_i'$  are produced from coefficients  $dc_i$  and pseudo random modulated watermark data in step E42.

- Wherein the said step of producing modified coefficient values does not use coefficients of magnitude greater than the said threshold  $T$  and does not use the corresponding information symbols (col. 10 lines 30-32). The step of producing (E42) only uses coefficients  $d_{ci}$ , which are only the low frequency coefficients or those that did not exceed the threshold value. All other coefficients from the image transformation and their corresponding information signals are not included in  $d_{ci}$  and so are not used in computing the modified coefficients.

Regarding Claims 33 and 47: Donescu discloses a method according to claim 32, wherein the modified coefficients  $C_i' = C_i + (\alpha) \cdot P_i$  where  $P_i$  is an information symbol modulated by the data to be embedded,  $\alpha$  being a scaling factor (col. 10 line 35). The  $\alpha_i$  is disclosed as a modulation amplitude which is another name for scaling factor.

Regarding Claims 34 and 48: Donescu discloses a method according to claim 33, wherein  $\alpha$  is dependent on the data (col. 10 lines 38-42).

Regarding Claims 35 and 49: Donescu discloses a method according to claim 33, wherein  $\alpha$  is of fixed value (col. 10 lines 47-48).

Regarding Claims 36 and 50: Donescu discloses a method according to claim 32, wherein the modified coefficients  $C_i' = C_i + (\alpha) \cdot R_i$  where  $R_i$  is an information symbol

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Pi modulated by the data, and alpha is a scaling factor (col. 10 line 35). The alpha<sub>i</sub> is disclosed as a modulation amplitude which is another name for scaling factor.

Regarding Claims 37 and 52: Donescu discloses a method according to claim 32, wherein the said transform is a wavelet transform (col. 8 line 67 – col. 9 line 3). The wavelet transformation would be applied in step E1.

Regarding Claims 38 and 53: Donescu discloses a method according to claim 32, wherein the transform is a spatial frequency transform (col. 8 line 67 – col. 9 line 3). Wavelet transformations and DCT transformations are types of spatial frequency transformations.

Regarding Claims 39, 54, and 64: Donescu discloses a method for detecting data embedded in material, the detecting method comprising:

- Receiving transform coefficients of the material (col. 13 lines 25-27). The corrupted image ( $I^*$ ) is composed of the transform coefficients. The block E100 is the initial step in the detection process which receives these coefficients as shown in Figure 13.
- Comparing the magnitudes of the received coefficients with a threshold value T (col. 13 lines 34-37). Filtering the coefficients is effectively a process of thresholding. (Note: "impossible" on line 34 is should be "possible")

- Correlating the said coefficients with respective symbols of a pseudo random symbol sequence to detect the said data, wherein the correlating step does not use coefficients of magnitude greater than the said threshold  $T$  and corresponding symbols of the pseudo random symbol sequence (col. 14 lines 3-9). In step E501 only the coefficients of the low frequencies ( $dc \cdot i$ ), which are those that did not exceed the threshold, are correlated with the pseudo random watermark signal ( $W$ ).

Regarding Claim 51: Donescu discloses the apparatus according to claim 50, comprising a pseudo random sequence generator (Fig. 8, block E41) and a modulator (Fig. 8, E42) for modulating the pseudo random sequence with the said data (col. 10 lines 23-32).

Regarding Claim 59: The analogous arguments made regarding claims 46 and 54 are applicable to claim 59.

Regarding Claim 60: Donescu discloses a method or apparatus according to claim 32, wherein the said data comprises a UMID (col. 1 lines 7-9). A UMID is a supplementary item of information.

Regarding Claim 61: Donescu discloses a method or apparatus according to claim 32, wherein the said material comprises video material (col. 5 lines 3-5). The material is

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disclosed as an image by way of example. A video is a series of images and therefore the application is applicable to videos.

Regarding Claim 62: Donescu discloses a method or apparatus according to claim 32, wherein the said material comprises audio material (col. 1 lines 35-40). The watermark is described as being capable of preserving the auditory quality of audio data.

Therefore the digital data may represent audio material.

### ***Claim Rejections - 35 USC § 103***

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 40 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donescu in view of Cox.

Regarding Claims 40 and 55: Donescu discloses a method according to claim 39 and the detection of the existence of a watermark, but does not disclose the removal of watermark data. However, Cox discloses removing the said data from the said received coefficients (col. 9 lines 53-59). The watermark data ( $W^*$ ) is extracted from the coefficients ( $X^*$ ) by block 46 of Figure 3b. It would be obvious to one of ordinary skill in the art to modify Donescu with the extraction process of Cox because it is common to

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not only detect the presence of a watermark, but to detect what the watermark information reveals. Furthermore, one would be motivated to extract the watermark to obtain copyright information.

18. Claims 41, 56, and 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donescu in view of Beattie et al. (PN 6,804,374). (hereinafter Beattie)

Regarding Claims 41, 56, and 65: Donescu discloses a method of detecting data embedded in material, the method comprising:

- Receiving transform coefficients of the material
- Comparing the magnitudes of the received coefficients with a threshold  $T_{clip}$
- Correlating the coefficients with a pseudo random symbol sequence to detect data embedded in the material

The analogous arguments made regarding claim 39 are applicable to the above limitations in claims 41, 56, and 65.

Donescu does not disclose the method comprising:

- Clipping, to a magnitude  $T_{clip}$ , the magnitude of coefficients of magnitude greater than the said threshold  $T_{clip}$

However Beattie does disclose a watermark detecting method comprising:

- Clipping, to a magnitude  $T_{clip}$ , the magnitude of coefficients of magnitude greater than the said threshold  $T_{clip}$  (col. 7 lines 10-11). The clip circuit performs

clipping, which is a well-known process of setting all values greater than a threshold value to the threshold value, on watermarked transform coefficients. These clipped coefficients would then be correlated according to Donescu's method of correlation explained above. It would be obvious to one of ordinary skill in the art to clip Donescu's coefficients as taught by Beattie because Beattie implements this circuit before correlation for the purpose of improving detection and increasing the efficiency of the detection system.

Regarding Claims 44, 58, and 66: The analogous arguments made regarding claim 32 are applicable to the receiving, comparing, and producing steps of claim 44. Also the analogous arguments made regarding claim 41 are applicable to the clipping step of claim 44.

19. Claims 42, 43, and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donescu in view of Beattie as applied to claim 41 above, and further in view of Cox.

Regarding Claims 42 and 57: The analogous arguments made regarding claim 40 are applicable to claim 42.

Regarding Claim 43: The analogous arguments made regarding claims 32 and 42 are applicable to claim 43.



***Allowable Subject Matter***

20. Claims 4-15, 20-31, and 63 would be allowable if rewritten to overcome minor informalities set forth in The Office Action.

***Conclusion***

21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Rao et al. (PN 6,222,932) is cited for teaching automatic adjustment of image watermark strength based on the input image.
- Miller et al. (PN 6,128,736) is cited for teaching initial insertion of a watermark signal using a perceptual model and then re-inserting the watermark using a scaled perceptual model.
- Op De Beeck et al. (PN 6,577,745) is cited for teaching watermark detection using correlation and thresholding.
- Rhoads (PN 6,307,949) is cited for teaching the use of a trial decode to discover innate biases that are used to calculate scaling factors used for watermark insertion.
- Nakagawa et al. (PN 6,104,826) is cited for teaching calculation of weight coefficients and using the results for watermarking.
- Donescu (PN 6,633,652) is cited for teaching inserting a watermark and authenticating a watermark using spatial transformation.

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- Cox et al. (PN 6,154,571) is cited for teaching watermark insertion using DCT transformation coefficients and correcting coefficients for reinsertion.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig W Kronenthal whose telephone number is (703) 305-8696. The examiner can normally be reached on 8:00 am - 5:00 pm / Mon. - Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703) 306-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

12/17/04  
CWK

MEHNDAD DASTOOR  
PRIMARY EXAMINER

*Mehndad Dastoor*